EFFECT OF SELECTED ASANAS AND YOGA NIDRA IN TERMS OF ADHD AND CORTISOL LEVEL AMONG CHILDREN

SYNOPSIS

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CERTIFICATE

I hereby declare that the **synopsis "EFFECT OF SELECTED ASANAS AND YOGA NIDRA IN TERMS OF ADHD AND CORTISOL LEVEL AMONG CHILDREN"** being submitted in partial fulfillment of the requirement for the degree of Doctor of Philosophy in Yoga under the Department of Yogic Sciences, Lakshmibai National Institute of Physical Education (LNIPE), Gwalior, Madhya Pradesh, India during the academic year 2020-2021.

It is a bonafide record of original work carried out under the supervision **of Dr. Moradhvaj Singh** and the co-supervision of **Dr. Vijay Kumar Singh** has not been submitted in full or part to any other university or institute for a degree or diploma.

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ABSTRACT

This research aims to investigate the effectiveness of selected yoga asanas and yoga nidra practice in managing Attention Deficit Hyperactivity Disorder ADHD and regulating cortisol levels among children. ADHD, characterized by inattentiveness, hyperactivity, and impulsiveness, affects millions of children across the globe, with many cases remaining undiagnosed. Conventional treatments often provide incomplete relief and may have side effects, highlighting the need for complementary approaches. This study will employ a randomized control design involving fifty children aging between 7 to 12 years diagnosed with ADHD. Participants will be divided into three groups: an experimental group practicing selected yoga asanas 15 to 30 minutes, 4 days a week, another experimental group practicing yoga nidra 10 to 25 minutes, 4 days a week, and a waitlisted control group. The 12 week intervention will assess changes in ADHD symptoms inattentiveness and hyperactivity impulsiveness using the ADHD Rating Scale, while cortisol levels will be measured through Cortisol saliva test. This research addresses a critical gap in alternative ADHD management approaches and has significant potential to provide evidence based, non pharmacological interventions for children with ADHD, benefiting families, educators, and healthcare providers by offering holistic management strategies for this neurodevelopmental disorder.

Keywords: Yoga Asana, Yoga Nidra, ADHD, Neurodevelopmental Disorder, Cortisol Hormone, Inattention, Hyperactivity, Impulsiveness

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CHAPTER –I

INTRODUCTION

The term "Yoga" is derived from the Sanskrit root “yuj,” meaning to connect, join, or balance. According to Damodaran (1967), the origins of philosophical thought in India can be traced back to the Upanishads and the Vedas, the dates of which remain uncertain. Between the seventh and second centuries BCE, numerous philosophical schools of thought emerged in India, some of which developed into comprehensive philosophical systems. Among these were the six Darshanas: Samkhya, developed by Kapila; Nyaya, by Gautama; Vaisheshika, by Kanada; Yoga, by Patanjali; Mimamsa, by Jaimini; and Vedanta, by Badarayana. Although each system is attributed to a founder, these individuals were not necessarily the originators of the ideas. Rather, they systematized pre-existing philosophical concepts that had been speculated upon by thinkers in India for centuries. For instance, Yoga as a concept existed long before Patanjali formalized it into a structured system known as Raja Yoga. Early philosophers articulated their systems in concise aphorisms called sutras. In the second aphorism of the Yoga Sutras, Patanjali defines Yoga as: Yogash chitta vritti nirodhah (Y.S. 1.2), which translates to, “Yoga is the cessation of the fluctuations of the mind-stuff (chitta).” The waves of thoughts or transformations in the mind are termed vrittis (literally “whirlpool”). Thus, Yoga involves restraining these ever-fluctuating chitta vrittis.

Yoga Nidra originates from ancient tantric practices, offering a method to achieve deliberate relaxation. Unlike common misconceptions, genuine relaxation isn't achieved by slumping into a comfortable seat with refreshments and entertainment. Such activities merely distract rather than truly relax. Authentic relaxation requires maintaining consciousness throughout the process - this defines the practice of Yoga Nidra, a state of alert tranquility.

This practice presents a comprehensive approach to attaining complete bodily, cognitive, and emotional ease. Yoga Nidra combines focused awareness and restorative stillness. During this practice, practitioners appear dormant while their awareness operates at profound levels of consciousness. This unique characteristic explains why Yoga Nidra is commonly described as psychological rest or deep relaxation with internal mindfulness. This intermediate condition between slumber and alertness naturally facilitates connection with deeper mental realms.

ADHD is A chronic condition including attention difficulty, hyperactivity and impulsiveness. ADHD term is referred as ‘attention deficit hyperactivity disorder’ and also known as ‘attention deficit disorder.’

ADHD is one of the most common mental disorders affecting children. More then10 million cases per year in India, most of the cases will not be diagnosed. ADHD often begins in childhood and can persist into adulthood. It may contribute to low self-esteem, troubled relationship and difficulty at school or work. Treatment can help, but this condition can’t be cured properly by modern medicines like Allopathy as well as by modern Psychology. In Chronic condition of ADHD, it can be last for years or be lifelong. It requires a medical diagnosis.

If we talk about symptoms of ADHD then we get a long list including many types of symptoms. Symptoms include limited attention, hyperactivity and Impulsiveness. In ADHD people may experience:

Behavioural: aggression, excitability, fidgeting, hyperactivity, impulsivity, irritability, lack of restraint, or persistent repetition of words or actions.

Cognitive: absent-mindedness, difficulty focusing, forgetfulness, problem paying attention, or short attention span.

Mood: anger, anxiety, boredom, excitement, or mood swings.

Also common: depression or learning disability.

To diagnose ADHD, doctors most often use guidelines established by the American Psychiatric Association. The group has identified 3 types of the disorder named Inattentive type, Hyperactive-Impulsive Type and Combined type. Combined type is the most common type of ADHD mostly peoples suffering from this type of ADHD.

When discussing treatment for ADHD, options typically include therapies and medications. Therapies include Cognitive Behavioral Therapy (CBT), anger management, support groups, counseling psychology, psychoeducation, family therapy, and Applied Behavior Analysis (ABA). In terms of medications, allopathic treatments include stimulants (e.g., methylphenidate, lisdexamfetamine, and dexamfetamine), cognition-enhancing medications, antihypertensive drugs (e.g., atomoxetine and guanfacine), and other medications to manage impulsivity.

ADHD in School Children**,** any children with ADHD show signs of the disorder before they reach school age. But it's in school, when they are having trouble meeting expectations for kids in their grade, that most are referred for diagnosis.

ADHD is one of the first things that's suspected when a child's behaviour in class, or performance on schoolwork, is problematic. A child who can't seem to sit still, who blurts out answers in class without raising his hand, who doesn't finish his homework, who seems to be daydreaming when the teacher gives instructions - these are well-known symptoms of ADHD. But these are also behaviours that can be a result of other factors, from anxiety to trauma to just being younger than most of the kids in the class, and hence a little less mature.

That's why it's important for teachers and parents both to be aware of what ADHD looks like in the classroom, and how it might be confused with other things that could be influencing a child's behaviour. Observing kids carefully is especially important when kids are too young to be able to articulate what they are feeling. And referring struggling kids for diagnosis and appropriate support can help them succeed in school and other parts of their lives, too.

STATEMENT OF THE PROBLEM

A Research is a gateway to finding opportunities to serve from individual to society or world level. This study "Effect of Selected Asanas and Yoga Nidra in terms of ADHD and Cortisol level among Children" have more potential in the Management of ADHD through Asanas and Yoga Nidra. This research will share a valuable information to the society. As we know that research leads to better understanding of the issues so we can get strong information related to ADHD and its management through Asanas and Yoga Nidra. Research builds knowledge and makes learning more efficient that's why the research is proposed. So the statement of the problem is stated as **"Effect of Selected Asanas and Yoga Nidra in terms of ADHD and Cortisol level among Children."**

OBJECTIVES OF THE STUDY

1. To characterize the level of ADHD (Inattentiveness, Hyperactivity-Impulsiveness) and Cortisol level of Yoga Asana, Yoga nidra and Control group of male children.
2. To characterize the level of ADHD (Inattentiveness, Hyperactivity-Impulsiveness) and Cortisol level of Yoga Asana, Yoga nidra and Control group of female children.
3. To compare adjusted mean scores of ADHD (Inattentiveness, Hyperactivity-Impulsiveness) and Cortisol level of Male and Female children by considering their pre-ADHD (Inattentiveness, Hyperactivity-Impulsiveness) and Cortisol level as covariate.
4. To compare adjusted mean scores of ADHD (Inattentiveness, Hyperactivity-Impulsiveness) and Cortisol level of Yoga Asana, Yoga nidra and control group by considering their pre-ADHD (Inattentiveness, Hyperactivity-Impulsiveness) and Cortisol level as covariate.
5. To study the influence of interaction between gender (male and female), Yoga Asana, Yoga nidra and Control group on ADHD (Inattentiveness, Hyperactivity-Impulsiveness) and Cortisol level by considering their pre ADHD (Inattentiveness, Hyperactivity-Impulsiveness) and Cortisol level as covariate.

DELIMITATIONS OF THE STUDY

- The study will be delimited to Fifty (N=50) ADHD Children.
- Age ranging from seven to twelve (07+-12) years.
- The study will be delimitated to minimum 12 weeks of training program.
- The exercise will be performed in the form of Yoga Asanas and Yoga Nidra practice for children.
- The study will be delimited to the following variables:

1. ADHD
   i. Inattentiveness
   ii. Hyperactivity- Impulsiveness
2. Cortisol level

LIMITATIONS OF THE STUDY

- The study will be limited to:
  1. Lifestyle of children
  2. Eating habits of children
  3. Daily routine of children
  4. Any responses which will be hidden by the respondent during the course of study will be considered as a limitation of the study.

HYPOTHESIS

Ho_1:- There is no significant difference in adjusted mean scores of ADHD (Inattentiveness, Hyperactivity-Impulsiveness) and Cortisol level of Male and Female children by considering their pre ADHD (Inattentiveness, Hyperactivity-Impulsiveness) and Cortisol level as covariate.

Ho_2:- There is no significant difference in adjusted mean scores of ADHD (Inattentiveness, Hyperactivity-Impulsiveness) and Cortisol level of different Yoga Asana group and Yoga nidra group by considering their pre ADHD (Inattentiveness, Hyperactivity-Impulsiveness) and Cortisol level as covariate.

Ho_3:- There is no significant influence of interaction between gender (male and female) and different Yoga Asana group and Yoga nidra group on ADHD (Inattentiveness, Hyperactivity-Impulsiveness) and Cortisol level by considering their pre ADHD(Inattentiveness, Hyperactivity-Impulsiveness) and Cortisol level as covariate.

DEFINITIONS AND EXPLAINATIONS OF THE TERMS

Inattentive Type: A person must have at least 6 out of these 9 symptoms, and few symptoms of hyperactive-impulsive type:

- Doesn't pay attention to detail or makes careless mistakes
- Doesn't stay on task
- Doesn’t listen
- Doesn’t follow instructions or finish schoolwork or chores
- Trouble organizing tasks or activities
- Avoids or dislikes doing things that take effort or concentration
- Loses things
- Easily distracted
- Forgetful

Hyperactive-Impulsive Type: A person must have at least 6 out these 9 symptoms, and few symptoms of inattentive type.

- Fidgets or squirms a lot
- Gets up from their seat a lot
- Runs or climbs at inappropriate times
- Has trouble playing quietly
- Always “on the go” as if “driven by a motor"
- Talks excessively
- Blurts an answer before the question has been completed
- Trouble waiting their turn
- Interrupts others

Combined Type. This is the most common type of ADHD. People with it have symptoms of both inattention and hyperactivity-impulsivity.

ADHD Rating Scale-IV (DuPaul et al., 1998) is a norm-referenced checklist that measures the symptoms of ADHD based on the diagnostic criteria of the *Diagnostic and Statistical Manual of Mental Disorders* (American Psychiatric Association [APA], 2000). As described in detail elsewhere (DuPaul et al., 1998), the ADHD Rating Scale-IV measures the frequency of two distinct behaviours: (1) symptoms associated with inattention and (2) symptoms associated with hyperactivity/impulsivity. In the present study, the inattention and hyperactivity behaviours of the participants were evaluated by the Kindergarten teacher with the help of the school version of the ADHD Rating Scale-IV. Whereas, the same preschool teacher evaluated the child at (T_0) and (T_1). The teacher assesses symptom frequency using a four-point Likert scale. The questionnaire consists of 18 items, nine items relating to inattention and nine items relating to hyperactivity. The behavioural scale of the students is an instrument for assessing frequency of inattention and hyperactivity/impulsivity behaviours. Results are described in terms of the Inattention subscale and the Hyperactivity-impulsivity subscale as well as the total score.

Cortisol Hormone. Cortisol is a steroid hormone, in the glucocorticoid class of hormones. It is produced mainly by the zona fasciculata of the adrenal cortex in the adrenal gland. It is produced in other tissues in lower quantities. Cortisol regulates a wide range of processes throughout the body, including metabolism and the immune response. It also has a very important role in helping the body respond to stress.

SIGNIFICANCE OF THE STUDY

The study may significant in the following ways

- To generate more evidence to prove effectiveness of Yoga Asanas and Yoga Nidra as a healing tool for ADHD.
- The study may disclose new facts regarding the function of Yoga Asanas and Yoga Nidra on neurodevelopmental disorders of childhood.
- The study will spread the importance of practicing Yoga Asana and Yoga Nidra.
- The study will provide guidance to yoga teachers and instructors to prepare training schedules.
- The results of the study may bring awareness in the society and families of those children who is suffering from ADHD.
- The results of this study will add new knowledge in the area of Yoga Asanas, Yoga Nidra and ADHD.

CHAPTER-II

REVIEW OF RELATED LITERATURE

The research scholar has gone through all the literatures available throughout the Internet. The literatures which are found relevant to the present study have been abstracted in this chapter to provide the back ground material to evaluate the significances of this study as well as formulation of training protocol:

Bigelow et. al (2021) studied "The differential Impact of Acute exercise and mindfulness meditation on Executive Functioning and Psycho-Emotional Well-being in Children and Youth with ADHD" For this study, a group of research from Ontario, Canada, recruited 16 children with ADHD from local community clinics between June 2019 and January 2020. The children were between 10 and 14 years old, and 11 of them were boys. Just 20% of the participants were non-white. Over a series of days, the children were asked to engage in 10 minutes of exercise, 10 minutes of mindfulness meditation, and 10 minutes of reading (which was a control by which to assess the other interventions). These activities were assigned in a random order. The researchers asked the children's guardians not to give them ADHD medication in the 24 hours before visiting the lab. The researchers took measurements on the children's executive functioning (including working memory, ability to control impulses, and task-switching capabilities) and psycho-emotional state at three points in time: before the activities, immediately after the activities, and again 10 minutes later. After analysing the results, the researchers found that mindfulness meditation improved children's working memory, ability to control their impulses, and task-switching skills. The results also showed that 10 minutes of exercise provided benefits to children's emotional well-being, such as a mood boost.

Pradhan, C. R. (2017) studied the "Effect of yoga nidra on cognitive activites of school students" this study involves subjects from both the genders male and female and age was limited to 13 to 15 years and the total number of subjects 200 in experimental group. The results offer a number of interesting findings. It shown students indicate significantly a greater degree of self-criticism after the intervention. Similarly, compared with pretesting session, students report a greater degree of academic efficacy and clustering skills. They also report a greater degree of self-control, empathy and overall competency compared with their scores. Girls indicate a greater degree of moral-ethical, personal, familial and social self-concept scores then do boys. They (girls) also reveal a greater degree of self-criticism and overall self concept compared with boys. Furthermore, girls report a greater degree of self-control and empathy than do boys. These findings are in the expected direction.

Vania et al. (2015) conducted a study with the title name "Does Mindfulness meditation improve attention in attention deficit hyperactivity disorder" in this study the attention deficit hyperactivity disorder (ADHD) manifests by high levels of inattention, impulsiveness and hyperactivity. ADHD starts in childhood and results in impairments that continue into adulthood. While hyperactivity declines over time, inattention and executive function difficulties persist, leading to functional deficits. Adolescents and adults with ADHD have pervasive impairment in interpersonal and family relationships. They may develop addiction, delinquent behaviour and comorbid psychiatric disorders. Despite advances in diagnosis and treatment, persistent residual symptoms are common, highlighting the need for novel treatment strategies. Mindfulness training, derived from Eastern meditation practices, may improve self-regulation of attention. It may also be a useful strategy to augment standard ADHD treatments and may be used as a potential tool to reduce impairments in patients with

residual symptoms of ADHD. Clinically, this would manifest by an increased ability to suppress task-unrelated thoughts and distractions resulting in improved attention, completion of tasks and potential improvement in occupational and social function.

Kumar, K. (2007) studied the effect of Yoga Nidra on stress and anxiety on college going students. The study conducted at the Yoga clinic of Dev Sanskriti Vishwavidyalya. Practice time was 30 min the duration was 6 months. 80 students were taken from PG yoga classes for observing the effect as well as 30 was in the control group. The result shows a significant change in the practice group as Yoga nidra positively decreased the stress level of the male and female subjects. Several other studies prove yoga nidra equally influences anxiety level significantly in both male and female subjects.

Jensen, P. S., & Kenny, D. T. (2004) studied "the effects of yoga on the attention and behaviour of boys with Attention-Deficit/ hyperactivity Disorder (ADHD)" this study involves Boys diagnosed with ADHD by specialist pediatricians and stabilized on medication were randomly assigned to a 20-session yoga group (n = 11) or a control group (cooperative activities; n = 8). Boys were assessed pre- and post-intervention on the Conners' Parent and Teacher Rating Scales-Revised: Long (CPRS-R:L & CTRS-R:L; Conners, 1997), the Test of Variables of Attention (TOVA; Greenberg, Cormna, & Kindschi, 1997), and the Motion Logger Actigraph. Data were analysed using one-way repeated measures analysis of variance (ANOVA). Significant improvements from pre-test to post-test were found for the yoga, but not for the control group on five subscales of the Conners' Parents Rating Scales (CPRS): Oppositional, Global Index Emotional Lability, Global Index Total, Global Index Restless/Impulsive and ADHD Index. Significant improvements from pre-test to post-test were found for the control group, but not the yoga group on three CPRS subscales: Hyperactivity, Anxious/Shy, and Social Problems. Both groups improved significantly on CPRS Perfectionism, DSM-IV Hyperactive/ Impulsive, and DSM-IV Total. For the yoga group, positive change from pre- to post-test on the Conners' Teacher Rating Scales (CTRS) was associated with the number of sessions attended on the DSM-IV Hyperactive-Impulsive subscale and with a trend on DSM-IV Inattentive subscale. Those in the yoga group who engaged in more home practice showed a significant improvement on TOVA Response Time Variability with a trend on the ADHD score, and greater improvements on the CTRS Global Emotional Lability subscale. Results from the Motion Logger Actigraph were inconclusive. Although these data do not provide strong support for the use of yoga for ADHD, partly because the study was under-powered, they do suggest that yoga may have merit as a complementary treatment for boys with ADHD already stabilized on medication, particularly for its evening effect when medication effects are absent. Yoga remains an investigational treatment, but this study supports further research into its possible uses for this population.

Kariyawasam, et al. (2002) studied "Reduced salivary cortisol in children with comorbid Attention deficit hyperactivity disorder and oppositional defiant disorder" Salivary cortisol was determined in thirty-two children with co-morbid ADHD and Oppositional-defiant disorder (ODD) according to DSM-IV criteria, compared to twenty-five healthy controls of similar age and ethnic background. Data were analysed according to prescription of stimulant medication in the patient group. The results support the possibility of a dysfunction of control of the HPA axis in these behaviourally disturbed children. A reduction in salivary cortisol could reflect under arousal, an elevated threshold for detection of stressors or a sub sensitivity of the HPA axis itself.

CHAPTER-III

METHODOLOGY

SELECTION OF THE SUBJECTS

Fifty (N=50) children will be selected from any School from India, who are suffering from ADHD.

CRITERIA OF DIAGNOSIS

To diagnose ADHD, doctors most often use guidelines established by the American Psychiatric Association. The association has identified three types of ADHD:

1. **Inattentive Type**: A person must have at least six out of nine symptoms, and few symptoms of hyperactive-impulsive type.
2. **Hyperactive-Impulsive Type**: A person must have at least six out nine symptoms, and few symptoms of inattentive type.
3. **Combined Type**. This is the most common type of ADHD. People with it have symptoms of both inattention and hyperactivity-impulsivity.

If the child have six or more than six symptoms of Inattention and six or more than six symptoms of Hyperactivity-Impulsiveness will be consider as ADHD patient.

SELECTION OF TESTS

- ✓ ADHD rating scale (Evaluation Form) by Dr. Rajshree Bhargava.
- ✓ Cortisol level will be measured by Cortisol Saliva test.

SELECTION OF THE VARIABLES

The following variables will be selected for the purpose of the study:

1. ADHD
   i. Inattentiveness
   ii. Hyperactivity- Impulsiveness
2. Cortisol level

DESIGN OF THE STUDY

Pre test, post test Randomized Group Design will be employed for the study.

COLLECTION OF DATA

The data will be collected by using ADHD Rating scale (Evaluation Form) by Dr. Rajshree Bhargava. Cortisol level will be measured by Cortisol Saliva test.

ADMINISTRATION OF THE TEST

Sample will be tested twice (pre-post) with an interval of minimum twelve weeks of training.

- There will be three groups:

1. Experimental group 1: (15-30 minutes, 4days/week Yoga Asana practice)
2. Experimental group 2: (10-25 minutes, 4days/week Yoga Nidra practice)
3. Waitlisted Control group: Best suitable yoga practice (either Yoga Asana or Yoga Nidra) will be given after 12 weeks of experiment

YOGA ASANA INTERVENTION PROCEDURE

The practice of selected Yoga Asanas will continue for 15-30 minutes over a period of 12 weeks, with the duration gradually increasing as the weeks progress.

YOGA NIDRA INTERVENTION PROCEDURE

The practice of Yoga Nidra will continue for 10-25 minutes over a period of 12 weeks, with the duration gradually increasing as the weeks progress.

STATISTICAL TECHNIQUES

For hypothesis testing, appropriate statistical tests will be applied.

EXPECTED OUTCOMES

This study is going to contribute to the improvement of psychological variables and cortisol regulation among children with ADHD through selected yoga asanas and yoga nidra practices. Through this research, we will be able to know whether these yogic interventions will improve those factors that show deficiency in children with ADHD and normalize their cortisol levels. Cognitive Functioning: Improved focus, attention span, concentration ability, working memory, and information processing. Behavioral Outcomes: Decreased hyperactivity, reduced impulsiveness, and better adherence to instructions. Physiological Benefits: Normalized cortisol levels and better stress response regulation. Mood Enhancement: Elevated mood, reduced frustration, decreased anxiety, better self-confidence, and improved social interactions. The findings will provide evidence-based yogic interventions that can complement conventional ADHD treatments.

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